ECONOMIC AND SOCIAL STRESS AND MATERIAL CULTURE PATTERNING

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This article suggests that accepted interpretations of variability in nonlithic material culture are insufficient. Recent ethnographic fieldwork in Kenya and Zambia and anthropological studies of societies in Sudan and Nigeria demonstrate that culture may be used by groups to communicate within-group corporateness in reference to outsiders. The greater the competition between groups for resources, the greater the likelihood that material culture will play a part in the maintenance of internal cohesion. Distinctive types of distributions and associations of artifacts occur as strains develop between spatially or hierarchically defined groups. The relevance of this view to archaeology is shown by two examples. Finally, it is suggested that this type of approach will allow a better understanding of the underlying causes of social and cultural change.

THIS ARTICLE SUMMARIZES THE RESULTS of recent ethnographic work in Kenya and Zambia (Hodder 1977, 1978a) and outlines a general approach to the study of archaeological material. Emphasis is on the patterning of cultural material other than stone tools and on the relationship between stress, society, and ecology among hunter-gatherers as it has been discussed by, for example, Yellen (1977). First, however, it would be well to review some of the traditional interpretations of nonlithic material culture patterning.

TRADITIONAL INTERPRETATIONS

It has generally been accepted that similarity in material culture is often produced by interaction between groups (Sherratt 1972:525; Struever and Houart 1972; Hodder 1978). Clarke (1968:414) notes that two factors affecting artifact similarity are the "efficiency of the person to person contact" and "the extent and continuity of contact." M. Cohen (1977:82) suggests that widespread homogeneity of ceramic styles should occur in hunter-gatherer societies when there is considerable movement of individuals from camp to camp. "Conversely, local specialization in artifact styles should be indicative of relative isolation among populations" (1977:82). Underlying the hypothesis suggested by Deetz (1965), Hill (1970), and Longacre (1970)—that matrilocal residence in a society with female potters leads to localization of pot styles—is the assumption that greater interaction and learning within descent groups are reflected in stylistic patterning. Although this may be the case under certain conditions, it is not always so (Stanislawski 1973).

The degree of interaction between groups has thus been used by both "processual" and "historical" archaeologists (for example, in Harding's [1974] identification of invasions and diffusions) to explain similarities and differences in material culture. Certainly the degree of interaction between individuals can have an effect on stylistic patterning, and especially on the distribution of exchanged items. For example, it is clear that frequencies of exchanged artifacts usually decrease with distance from their source (Renfrew 1977). But is the probability of contact, related to the distance between groups, itself a sufficient explanation for this and other patterning in material culture? It will be shown below that, in some forms of social environment, frequencies and/or similarities in material culture traits do not fall off with distance in any simple way. In addition, it is doubtful whether human societies or individuals (for example, female potters) are ever so isolated from immediate neighbors that artifacts and styles do not have the chance to move or be copied from one to another. As Dole (1968:88) has noted, "characterizations of tribes in terms of similarity in specified cultural traits, limits of interaction, or the possession of several traits in

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common are inadequate because they are based on an implicit assumption that human groups and their cultures are closed systems. . . . Actually, all human groups are open systems in that they interact with other groups. . . . It is apparent that there is no inherent reason why different traits should have coterminous boundaries." Distance and the probability of interaction are often insufficient to "explain" the form of artifact distributions, and the relative "value" of artifacts as well as other factors to be discussed below must often be invoked. Localized variability as opposed to regional homogeneity in stylistic traits has often been related to methods of manufacture and dispersal (Nicklin 1971; Whitehouse 1969). Dispersed manufacture and dispersal are seen as leading to greater localization of styles than centralized manufacture. While the scale of production may be relevant for the interpretation of some stylistic patterning, it is irrelevant under certain social conditions (Hodder 1980).

AN ALTERNATIVE VIEW

Ethnic Boundaries

Recent work in the Baringo district, western Kenya, has suggested some of the contexts in which the explanations above and others (such as functional or activity) of variability in material culture patterning are incomplete. The tribal groups in the Baringo area maintain material culture differences in items of dress and display (earrings, necklaces, shields, and so on) and daily use (eating and cooking artifacts, for example, pots) and in the spatial patterning of features within huts and settlements. There is great uniformity in material culture over the extensive areas occupied by each of these acephalous tribes, and there are relatively sharp boundaries between them. Exchanged items, made in one main area and distributed within a tribe, often show a sudden decline in frequencies at the borders. The styles of nonexchanged, locally made products often show great similarity within and sharp differences between tribes.

The subsistence economies of the groups in the Baringo area are cattle based, and some farming of arable land is also practiced. The tribal distinctions cannot be explained as the result of different economies or environmental adaptions. The cultural uniformity within and differences between groups are also not caused by patterns of interaction. There is intense daily contact between members of different tribes, and there has been a history of considerable migration from tribe to tribe. When an individual moves or marries into another tribe, he or she changes dress and material culture to conform to the new social and cultural environment. Many individuals have relations in other tribes, so that cooperation in cattle grazing and farming of arable land is possible.

The ethnographic work suggested that the material culture differences between tribes can only be understood if material culture is seen as a language, expressing within-group cohesion in competition over scarce resources. The relationship between material culture patterning and conflict over resources is seen most clearly when different borders between tribes in the Baringo area are examined. In some border areas, cultural differences are less clear cut. Hut compounds of two neighboring tribes are found intermingled, women wear mixed forms of decoration, and there is a spread of traits across the "border." In such border areas economic stress is relieved by, for example, the exploitation of a wider range of resources, including fish, by slightly different adaptations of the two local groups to the same environment, and by lower population densities.

In another border region there is extremely high population density, and the neighboring tribes compete for the same scarce resources with identical economies. Corresponding to the greater conflict and raiding in these areas, material culture dichotomies are clearly stressed. There is less "blurring" of the boundaries and no intermingling of compounds of different tribes, and individuals infrequently wear ornaments showing "mixed" influences. Oral accounts and the distribution of older artifact forms in the Baringo area suggested (Hodder 1977) that much of the recent temporal variation in material culture patterning, in addition to the spatial variation discussed above, could be related to changes in the degree of conflict and competition over resources and the resulting need to stress overtly clear, unambiguous identities.

There have been few ethnographic studies of material culture patterning at the regional scale that explicitly examine the types of relationship outlined above. Bennett (1975) shows that cultural symbols often play a part in ethnicity when this is used as a strategy for achieving what one wants and needs. Work by Southall (1976) and A. Cohen (1974) also provides some interesting comparisons with the Baringo material, and the latter study is worth summarizing because it shows how material culture may be used to support and symbolize groups in competition. In the Yoruba city of Ibadan in Nigeria during the early 1920s, there were two immigrant groups. The Hausa and the Western Ibo were encouraged to settle in special quarters of the city where tribal customs and religion were maintained. When studied by Cohen in 1963, the two immigrant groups had adapted very differently to the Yoruba host population:

> The Hausa had not only preserved their distinctiveness but also deepened their cultural identity and exclusiveness. They spoke only Hausa and interacted socially, as friends and relatives, only among themselves. A tense cleavage existed between them and some sections of the host population, brought about by continuous quarrels and hostility (1974:92).

The conflict resulted from continual and bitter rivalry with competitors from other tribes for the ethnic control, or monopoly, of long-distance trade. The organization of this trade was achieved by the cooperation of the members of the monopolizing ethnic community speaking the same language, observing the same code of conduct, and symbolizing their coordination in a distinctive material culture.

The Western Ibo, on the other hand, gradually lost their social and cultural distinctiveness, and their residential segregation within the city broke down. Their role within Yoruba society was one not of economic competition but of incorporation, working within the existing framework. Western Ibo are found scattered in places of employment all over Ibadan, doing a wide range of work. Their cultural distinctiveness is thus unnecessary or even disadvantageous, since their livelihood is based on economic integration.

Subgroup Boundaries

There is thus some ethnographic evidence that suggests that material culture can be used to express and reinforce aspects of social relationships that are related to economic and political strategies. This is true between sex, age, and political groups within societies as much as it is true between societies as a whole. For example, in the Baringo area there was a very clear difference between the clothes and decoration worn by young unmarried men (*moran*) and those worn by older age-sets who are able to marry. A considerable amount of tension between the younger and older men often existed over access to women as wives. Spencer (1965) has suggested that the whole polygamous structure of these societies depended on preventing the young men from marrying and therefore using up the available supply of women. This is a clear example of a competitive and unbalanced access to resources (in this case women and the cattle wealth that the marriage of their daughters will ultimately provide), and it might be suggested that it was partly because of this competitive relationship that the cultural differences between the young and the old men were so very clear.

In much the same way, as tensions develop between status or political groups within centralized societies, these groups will often express their internal corporateness in distinctive cultural traits (A. Cohen 1974). A relationship between cultural differences and hierarchical rank is seen in the Barotse (Lozi) kingdom in western Zambia (Hodder 1980). Certain artifact types such as a double clapperless bell are awarded by the king and queen of the Lozi to statesmen, royal hunters, and others of high rank. Other artifacts, such as feather crowns, eland tail fly-switches with specially carved ivory handles, and (in the past) ivory wrist bangles, were also the property of particular sets of high-status individuals. These various artifacts symbolized an elite that administered the kingdom and controlled the metal sources and such procedures as the collection of taxes. Material culture can be seen as reinforcing the corporateness of the ruling group in contrast to the rest of the population.

The Lozi example also shows that the existence of a highly centralized state may make it unnecessary for previously distinct identity groups below the level of the elite to maintain separate overt cultural characteristics. Cultural differences between, for example, old and new immigrants to the state may be gradually watered down because there may be fewer pressures to maintain separate identities if economic competition over resources is lessened by the presence of the state. Thus there may be a leveling out of material culture in highly centralized systems.

But at the same time as the distinctions between ethnic *groups* in state systems may decrease, variability in the material culture associated with *individuals* may be greater than in some forms of decentralized societies, such as the Baringo ethnic groups. In a state system like the Lozi in the late nineteenth century, there are few pressures demanding local and regional conformity in material culture. Economic dependencies on one's neighbors or on members of the same "tribe" within the state are to a considerable extent replaced by dependence on the center, the king. As a result the villages of the Lozi tribes are intermixed, and there is considerable variability in the artifacts associated with and made by an individual. This ability of state systems to support greater cultural heterogeneity than some decentralized systems has been noted elsewhere (Colson 1969:30; Lancaster 1974:707–708). For example, "in the acephalous societies of northern Ghana, political incorporation means cultural assimilation. In the state systems it may entail no more than co-residence, though the degree of cultural assimilation clearly affects a man's political role" (Goody 1969:171).

Thus the growth of a central authority may remove some of the reasons for the "horizontal" economic dependence and cultural conformity within local groups and the reasons for the economic conflict and cultural distinctions between them. But tensions may be felt "vertically" between ranks and levels and other interest groups and may reemerge along the lines of preexisting ethnic units. The exact form of any dichotomies overtly stressed between groups within complex societies will depend on the way in which social strains develop in relation to competition over resources or privileges and access to power in particular instances. The aim here is not to develop general models of what centralized and decentralized societies "look like" in material culture terms but to outline an approach to the study of the relationship between economic, social, and cultural-symbolic aspects of behavior.

Economic Stress

If cultural patterning is to be interpreted in terms of economic strains and if evidence of the type described above is to be of any value in archaeology, stress within the subsistence economy must be recognizable in the record of the past. M. Cohen (1977) has identified 14 ways in which an archaeologist might detect strain in a particular adaptation to an environment. These include the spread of settlement into new ecological zones, concentration on previously ignored microniches, a move from dependence on large to dependence on small wild animal resources, environmental degradation due to man, and decreases in the sizes of shells and domesticated animals. Jarman and Jarman (1968) have suggested that a more intensive economy under stress might be reflected in decreasing size of bones of domestic stock, a decreasing range of variability in the bone sizes, and such changes in age composition as an increase in the number of immature animals. Clear evidence of autumn killing of sheep (Halstead 1978) may also indicate stress—an inability to keep animals alive over the winter. R. Gould (personal communication) has noted that in some areas of severe stress in hunter-gatherer societies in Australia, bones are broken into smaller pieces to extract the fullest possible edible content. These examples illustrate that archaeological evidence does contain a great potential for the measurement of increases and decreases in stress in subsistence economies and in pressure on the environment.

IMPLICATIONS

What are the main conclusions to be drawn from the account above, and what sort of approach to the study of archaeological evidence is suggested?

Emphasis has been placed on the idea that artifacts hold information. Items of material culture

can be seen as a medium of communication between individuals and groups. As Leach (1976:10) assumes, "*all* the various non-verbal dimensions of culture, such as styles in clothing, village layout, architecture, furniture, food, cooking, music, physical gestures, postural attitudes and so on are organized in patterned sets so as to incorporate coded information in a manner analogous to the sounds and words and sentences of a natural language. I assume therefore it is just as meaningful to talk about the grammatical rules which govern the wearing of clothes as it is to talk about the grammatical rules which govern speech utterances." Artifacts can express underlying needs and symbolize and support social relationships.

Artifacts play an especially important role in symbolizing and supporting social relations when those relations are under strain. When tensions exist between groups, specific artifacts may be used as part of the expression of within-group corporateness and "belongingness" in reference to outsiders. Spatial distributions of exchanged items may show plateaus of similar frequencies within groups and sharp breaks at the boundaries; the styles of locally made items may also show plateaus of similarity with breaks at the edges; degrees of association between sets of cultural traits may be high. Tensions between hierarchical, age, and sex groups within societies may also be expressed in the structure of artifact associations. Archaeologically this may be especially clear in burial contexts, where sets of artifacts may occur only with individuals of certain ages and sexes.

It has been suggested that social and economic tensions are closely linked. Changes in social structure may involve changes in economic organization and place stress on the productive capacity of certain sections of society. On the other hand, economic stress may necessitate a greater reliance on social or neighborhood ties and increase the overt dichotomy between groups. As an example, if stress is placed on existing resources within the context of a particular adaptation to an environment, social relations within and between groups may develop that are related to and allow economic competition for the available resources. Stress may also affect the internal structures of societies and may be particularly felt in certain domains of economic and social relations within groups. In such instances part of the material culture patterning may be expected to relate closely to those aspects of the social structure under stress. These aspects may therefore become more "visible" to the archaeologist, if there is adequate survival and recovery of the evidence. Discrete regionalization or discrete associations of artifact styles may develop as tensions and strains gradually build up within a particular social and economic framework.

Various other aspects of the archaeological evidence may often be related to the ties between society, economy, and culture noted above. For example, while certain aspects of cultural evidence may show plateaus within and sharp breaks between competing interest groups, other artifacts may be involved in simultaneous attempts to lessen the level of conflict. Ceremonial gift exchange (Strathern and Strathern 1971) may involve the exchange of highly valued prestige items between competing groups, exchanges that may play a part in maintaining relative peace. In Mt. Hagen, New Guinea, the ceremonial exchanges of valuables between groups "are ostensibly made to keep the peace; but they contain a latent rivalry, expressed in the size of gifts, in speeches, and in [bodily] decorations" (Strathern and Strathern 1971:14). Thus as dichotomies between groups in some aspects of material culture increase, the exchange of other items between groups may also increase (as in the archaeological example from southern France given below).

Another aspect of archaeological evidence that may be related to stress and conflict is religion and ritual. Renfrew (1976) has suggested that large burial mounds and monuments may be used to symbolize local competing groups and lineages. Such mounds may become more important as group awareness in reference to other groups increases in stressful situations. Religion may also aid contacts between competing groups by providing a neutral context for exchange. For example, temples occurred on the boundaries between tribes in Roman Gaul and Britain (Lewis 1966:130; Stevens 1940:166), and they appear often to have been associated with border markets. More generally, as strains develop between groups within societies, religion may become important as a mechanism for ensuring acceptance by one group of the constraints of another (Drennan 1976). As Rappaport expresses it:

> To sanctify conventions is also to ameliorate, at least partially, the conflict between the individual and the society. The interests and needs of the society are presented to the individual as his own ultimate interests and needs, and his inconveniences and sacrifices on behalf of the society are rewarded symbolically (1971:26).

ARCHAEOLOGICAL EXAMPLE

It is necessary to provide an archaeological example that shows the relevance of the ideas suggested in this paper and the inadequacy of the assumption that similarity in material culture reflects degrees of contact and interaction. The example used is that of the southern French Neolithic (see Blackmore et al. 1978 for a further example). The earliest phase of the Neolithic in southern France, the Impressed Ware, lasts for at least 1,500–2,000 years, beginning in the sixth millennium B.C. Settlement is mainly in caves within the Mediterranean ecological zone. Economic evidence from these sites suggests a continuation from the Mesolithic in the use of fish, molluscs, and wild animals as important food sources. There is little evidence of carbonized grain until the fifth millennium B.C. (Phillips 1975). Pottery styles show little evidence of marked regionalization, and there is little cultural change and expansion during this long period.

The following Chassey tradition (ca. 3800 to 2600 B.C.) shows a greater localization of pot styles. Regional groups with distinctive traits can be recognized in the middle gorges of the Verdon, the Gardon Valley, and the valleys of the Grands Causses. The cultural fragmentation that occurs during this period cannot be interpreted in terms of a decrease in interaction between sites. Marine shells are still found inland, and there is trade in flint and obsidian. Only one piece of obsidian has been recovered so far from Impressed Ware contexts in southern France, while large amounts, obtained from Sardinia, occur in the Chassey. Thus increased cultural differentiation in certain aspects of material culture occurs at the same time as increased evidence for exchanges between groups.

On the other hand, there is evidence during the Chassey of economic changes and a more intensive farming economy. Wild animal bones on sites decrease in numbers (below 10%), and there is more evidence of farming even in apparently unfavorable environments, such as steeply sloped valley sides. Related to the economic intensification, there is an increase in the number of open sites, and new environments are colonized. More sites are found, and they are often of greater size (St-Michel-du-Touch covers 20 ha). The evidence for the Chassey thus indicates population increase and pressure on resources. This pressure may have been partly relieved by the expansion of settlement northward and out of the Mediterranean littoral zone (Bender and Phillips 1972:map 3). But the pressure seems also to have resulted in increased local dependencies, which were symbolized in the regional fragmentation of material culture. The increased trade in obsidian may have involved ceremonial exchange between competing groups.

Cultural fragmentation increased in the south French Late Neolithic (ca. 2600–2300 B.C.), when a complex series of local cultural groups (Hérault, Grands Causses, Cros, Ferrières, etc.) can be identified. At the same time there is yet further evidence of between-group trade in localized resources (Phillips et al. 1977:315). Thus patterns of interaction cannot be used to explain the differences maintained between groups in pot styles. The pottery differences could perhaps be related to increased specialization of pottery production if it could be shown that this occurred, but the cultural differences between groups could not be explained by the methods of production alone. Localized production does not necessarily lead to localized stylistic differences since the earlier manufacture of widely similar pottery was probably dispersed (Phillips et al. 1977:309). In searching for alternative explanations for the Late Neolithic cultural differentiation of pottery and tomb types (Phillips 1975:121), it is of interest to note that the period sees a continued lack of emphasis on wild animals as a food source and an expansion of settlement on the less productive *garrigue* uplands. Increased pressures and strains are thus indicated, and walls and towers surround the site at Lébous (Guilane 1976).

It would thus be possible to interpret the developments in the south French Neolithic as reflecting a gradual increase in local within-group dependence as strains and pressures on the environment increased. Within-group dependence was symbolized in localized conformity of material

culture, while conflict between groups for available resources within the existing framework of society led to marked cultural differences between groups. It is of further interest that the economic intensification and population expansion in the third millennium are contemporary with the appearance of megalithic tombs. Increased local lineage cooperation in farming activities, an emphasis on lineages (Meillassoux 1972), and the need to symbolize local competing groups may have encouraged the building of these monuments.

CONCLUSION

The traditional emphasis on establishing types of assemblages or "cultures" and the emphasis on archaeological "entities" (Clarke 1968) are seen from the perspective put forward above as a sterile and arbitrary exercise, however much "objective" quantification and computerization are applied. We cannot assume that all aspects of material culture were involved in symbolizing past identity groups. The totality of material culture used to define "cultures" reflects more than one type of past behavior (Binford 1972).

It should also be stressed that the type of approach being suggested here has nothing in common with attempts at correlating archaeological "cultures" with "tribes." Childe (1951:47) noted that the "boundaries of the several fields of culture do not necessarily coincide," and Haaland (1977) has provided a useful review of the difficulties involved in this sphere. Barth (1969:13) states "we can assume no simple one-to-one relationship between ethnic units and cultural similarities and differences." As a result of long-term historical processes, different ethnic groups may have very similar material culture, while the same ethnic group may have a varied material culture in an ecologically varied area. It is therefore invalid to tot up the numbers of cultural similarities and differences between archaeological assemblages, erect "cultures," and assume that these have some ethnic, linguistic, or other significance.

As A. Cohen suggests, "The history of a cultural trait will tell us very little about its social significance within the situation in which it is found at present" (1974:3). What is being suggested in this article is the study of the *structures* of distributions of individual traits and the structures of the associations between such distributions at particular moments in time. For example, regional plateaus of similar frequencies of some traits in assemblages may be found with sharp falloffs at the edges, and this structure and its associations may be of the type that cannot be explained by normal distance-decay falloff or by an environmental, functional adaptation. In this case we can suggest the hypothesis that the highly structured traits held some importance as defining an interest group, and we can test this hypothesis against other artifactual evidence and consider the economic strains that could have led an interest group to use artifacts in the suggested way. In other words, the archaeologist cannot hope to identify all the tribes or ethnic groups that existed in the past, but he can identify *ethnicity* if by this is meant (A. Cohen 1974) the *mechanism* by which interest groups use culture to symbolize their within-group organization in opposition to and in competition with other interest groups.

The views suggested in this paper also differ from the broadly cross-cultural approach that seeks to define "tribes," "chiefdoms," "states," and so on in the archaeological record (for example, Flannery 1972; Renfrew 1973). Such classification hides many forms of relationships between the social, economic, and cultural-symbolic dimensions of human behavior. To identify categories of society does not lead to an understanding of causal relationships between these dimensions or to comprehension of the reasons for societal change, since evolution is reduced to something that takes place between stages.

The same criticism, that existing approaches in archaeology cannot adequately determine the reasons for social, economic, and cultural change, is also applicable to the "systems" and "processual" schools. These have a value in stressing the interrelationships between variables and subsystems. But to show that some relationship did or could have existed between different aspects of life in the past is to do little more than describe a set of functional relationships and note their changing configuration through time. Systems theory is an empirical method that

allows causal statements about observed behavior to be examined (Langton 1972:170). The systems theory methodology permits description of how a particular historical relationship between the political-economic, social, and cultural-symbolic dimensions came about, but it does not of itself provide the reasons for the developments and changes. "Systems function for a *purpose* to which the function itself is subservient" (Langton 1972:141). Renfrew (1972:496) notes that systems theory does not explain cultural change. But it is not satisfactory to assume that archaeology is unable to identify underlying causes. If emphasis is placed on the way in which the individual's wants and needs are reflected symbolically in material culture, then the "purpose" of systems and the reasons for cultural change may be amenable to study. Major structural changes in the organization of societies can be examined in reference to the buildup of social and economic tensions between and within communities. The nature and locus of these tensions may help to indicate the reasons for change.

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